UNITED STATES MARINE CORPS
Logistics Operations School
Marine Corps Combat Service Support Schools
Training Command
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AIM 5303

STUDENT OUTLINE

REPAIR NEW PROCESS MODEL 242 TRANSFER ASSEMBLY

LEARNING OBJECTIVES

1. Terminal Learning Objective: Provided with a faulty New Process Model 242 transfer, required tools, replacement parts, shop supplies, cleaning materials, and TM 9-2320-280-34, disassemble the transfer, per current serviceability standards and reference.

2. Enabling Learning Objectives:

a. Provided with a faulty New Process Model 242 transfer, required tools, replacement parts, shop supplies, cleaning materials, and TM 9-2320-280-34, disassemble the transfer, per current serviceability standards and reference.

b. Provided with a faulty New Process Model 242 transfer, required tools, replacement parts, shop supplies, cleaning materials, and TM 9-2320-280-34, inspect the transfer components for serviceability, per current serviceability standards and reference.

c. Provided with a faulty New Process Model 242 transfer, required tools, replacement parts, shop supplies, cleaning materials, and TM 9-2320-280-34, replace the unserviceable components, per current serviceability standards and reference.

d. Provided with a faulty New Process Model 242 transfer, required tools, replacement parts, shop supplies, cleaning materials, and TM 9-2320-280-34, assemble the transfer, per current serviceability standards and reference.

OUTLINE

1. PRINCIPLES OF OPERATION OF THE NEW PROCESS MODEL 242 TRANSFER

a. The New Process Model 242 transfer assembly is an aluminum case, chain driven, four-position which are High, High Lock, Low and neutral. It has a four-piece case containing front and rear output shafts, a mainshaft, two drive sprockets, a shift mechanism, differential and a planetary gear assembly.

b. The transfer case provides constant 4-wheel drive in all transfer and transmission gear ranges with one input, two outputs, and a differential inside. It permits independent drive, or lockup of the front and rear axles.

c. In all drive range positions, input torque is transmitted to the transfer case gear train through the transfer case input gear.

d. The transfer case shift lever allows the operator to select four transfer case modes of operation and two gear ranges.

(1) The “HIGH” (H) position provides a 1.01:1 gear ratio, it also permits the front and rear axle to operate independently though the differential inside the transfer case and still maintain 4-wheel drive.

(a) Torque flows from the input gear to the differential assembly by means of the range clutch. Torque is then transferred through the differential to either the mainshaft and then out to the rear output or through the drive and driven sprocket to the front output.

(b) The drive sprocket drives the chain assembly, which in turn rotates the driven sprocket. Since the driven sprocket is splined to the front output shaft, the front output shaft rotates.

(2) The “HIGH LOCK” (HL) and “LOW" (L) positions, provide full-time 4-wheel drive with both axles locked together, by-passing the differential in the transfer case. The (L) positions also provides an additional gear reduction to the drive train.

(a) Torque flow is the same as in high with the exception of the differential. In “LOW” range, the range clutch sleeve is shifted, disengaging it from the Input gear shaft with the low range gear. Since the annulus gear is fixed in the case, it is held stationary and does not rotate. This causes the planetary pinions to rotate about the annulus gear internal teeth, producing gear reduction of 2.72:1 .

(b) A sliding mode clutch is moved into a position that locks the differential together internally to the mainshaft, eliminating differential action. Both front and rear outputs turn at the same speed.

(3) The (N) is a Neutral position.

e. The HMMWVA2, with the Model 242 transfer has a feature not found on the older HMMWV, with the Model 218 transfer. This new feature is called a transfer case indicator lamp.

(1) The transfer case indicator lamp illuminates when the transfer case is engaged in a HIGH LOCK (HL) or LOW (L) position.

(2) The light should go out when the shift lever is returned to the HIGH (H) position. If the light does not go out, place the transmission in reverse and drive backwards for approximately 10 feet to eliminate drivetrain torque buildup. The light will then go out.

f. The most common problem with the operation of the transfer is not stopping before shifting the transfer, with the transmission in neutral. The Operator's Manual specifies that the vehicle must be stopped, engine off, and the transmission in "N" (neutral). Failure to do this will result in damage to the drivetrain.

g. Other problems found with the transfer are caused by improper adjustment of the transfer shift linkage. If the linkage is not adjusted correctly, the transfer is not going to operate the way it should. However, if the linkage is adjusted correctly and the transfer is not operating properly, then you have an internal problem and the transfer will have to be disassembled and repaired.

h. The model 242 has an oil cooler. The transfer case is cooled by transmission fluid flowing independently through the oil cooler to the transmission.

i. The model 242 has an Internal oil pump which is driven directly off of the mainshaft, this pump assist in lubricating the internal parts

2. PRACTICAL APPLICATION AND PERFORMANCE TESTING ON THE REPAIR OF THE NEW PROCESS MODEL 242 TRANSFER ASSEMBLY

a. Instructions to Students

(1) Each student will be assigned a New Process Model 242 transfer for the performance test.

(2) You will be required to perform the following procedures:

(a) Disassemble the New Process Model 242 transfer assembly.

(b) Inspect the New Process Model 242 transfer assembly components.

(c) Assemble the New Process Model 242 transfer assembly.

(3) Required tools, supplies, and reference materials will be available to you.

(4) You will perform each function on your assigned component and your performance will be evaluated by the assistant instructors concurrently with your accomplishment of each task.

(5) If any problems are encountered, or if you have any questions, contact the assistant instructor assigned to your station.

(6) You will not remove any seals and discard them unless the instructor directs you to do so. However, if you find a bad seal, let the instructor know.

(7) After you have the transfer disassembled, all parts will be cleaned and lubricated with petroleum jelly before reassembly.

(8) During reassembly you will also use the petroleum jelly to hold the needle bearings on the mainshaft. You will not be using RTV sealant during reassembly.

c. Conduct the Performance Test

(1) Disassemble the transfer assembly. Disassemble the transfer according to the instructions contained in TM 9-2320- 280-34. Have your instructor check your work after you complete each step.

(a) Disassemble upper half of transfer case up to PAGE 8-39, STEP 26.

STOP! Have instructor present for removal of tapered drive pin from shift shaft. _____

(b) Disassemble lower half of transfer case.
STOP! Have instructor check your work. _____

(2) Inspect the transfer components. Follow the instructions in TM 9-2320-280-34 for inspecting the transfer components. Notify your instructor of your findings.

(a) Inspect case halves.

(b) Disassemble and Inspect differential assembly.

STOP! Have instructor check your work. _____

(c) Reassemble differential.

(d) Disassemble and inspect mode shift fork assembly.

STOP! Have instructor check your work. _____

(e) Assemble mode shift fork assembly

(f) Inspect all other components.

STOP! Have instructor check your work. _____

(3) Assemble the transfer. Follow the instructions in your student outline and TM 9-2320-280-34 to assemble the transfer assembly. Have your instructor check your work after each step is completed.

(a) Assemble lower half of transfer case up to PAGE 8-55, STEP 21.

STOP! Have instructor present for tapered drive pin installation.

(b) Assemble upper case half of transfer up to PAGE 8-58, STEP 32.

STOP! Have instructor check your work. _____

(c) Assemble the rest of the transfer case assembly.

STOP! Have instructor check your work. _____

REFERENCE:

TM 9-2320-280-34